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Phlogopite Mica in Ontario

By
D. F. HEWITT

1968

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PHLOGOPITE MICA IN ONTARIO

By

D. F. Hewitt

ABSTRACT

This mineral resources circular briefly describes 160 phlogopite mica deposits in Ontario, mainly situated in the Sydenham and Perth areas of southeastern Ontario. Production of mica began in Ontario about 1860 and has continued up until the present time with a total production of 97,107,210 pounds valued at $4,571,977 since 1886. About 60 percent of the Ontario production of mica has been phlogopite, the remainder being muscovite.

PHLOGOPITE MICA IN ONTARIO

By

D. F. Hewitt[1]

INTRODUCTION

Muscovite and phlogopite mica are widely used in the electric and electronics industries, especially as bridges and spacers in radio and television tubes and as the dielectric in capacitors. Records on mica production in Ontario indicate production from 1886 to the present, but mica was produced commercially in Ontario as early as 1860. Total Ontario mica production from 1886 to 1966 has amounted to 97,107,210 pounds valued at $4,571,977. Records indicate 63 muscovite mines and 160 phlogopite mines in the province. Of the muscovite mines, the Purdy mica mine at Mattawa was by far the largest, producing $1,577,326 worth of muscovite between 1941 and 1953. This represents 34.5 percent of Ontario mica production. A large percentage of the Ontario phlogopite production came from the Lacey mica mine near Sydenham, which began operations about 1880 and produced

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[1] Senior Geologist, Industrial Minerals, Ontario Department of Mines, Toronto. Manuscript received by the Director, Geological Branch, 13 March, 1968.

intermittently until 1948. Partial production of the Lacey mine from 1900 to 1948 amounted to 5781 tons of phlogopite valued at $827,756. Crystals up to 9 feet in diameter were produced. The principal phlogopite producing areas in Ontario were in Loughborough and Bedford townships in Frontenac county, and in North Burgess township in Lanark county near Perth. At the present time mica production has fallen off: in 1966 Ontario production amounted to 200,920 pounds valued at $4,367.

Phlogopite or amber mica is the potassium-magnesium mica. It is monoclinic, with perfect basal cleavage, and sometimes has parting parallel to (010) and (110). Hardness ranges from 2.5 on cleavage surfaces, to 4 across the cleavage. The specific gravity is 2.8 to 3.4, increasing with iron content. Colour is pale yellow to brown or brownish-black.

Physical defects affecting the value of mica are discussed by Hewitt (1967a, p. 26-28). Uses of mica are given by Hewitt (1967a, p. 29).

Prices

Prices are a matter of negotiation between the mica buyers and the producers, and depending on size and quality of the mica. Most of the phlogopite is imported from

Madagascar. Prices for Madagascar sheet mica, first quality high heat, duty paid, New York, per pound are given in Metals Week for December 25, 1967 as follows:

Grade 7 (below 1 square inch)	50¢
Grade 6 (1 to ½ square inch)	85¢
Grade 5 (3 to 6 square inch)	$1.20
Grade 4 (6 to 10 square inch)	$2.50
Grade 3 (10 to 14 square inch)	$3.25

Type of Phlogopite Deposits

The principal type of phlogopite deposit in Ontario is the metamorphic pyroxenite type which occurs in the Perth and Sydenham areas of the Grenville geologic province of southeastern Ontario. The metamorphic pyroxenite deposits occur in terranes of high grade metamorphic and granite gneisses associated with marble and paragneiss. The metamorphic pyroxenite is thought to be altered marble.

There are 3 varieties of metamorphic pyroxenite deposits: The vein or fissure type where leads of mica associated with apatite and calcite cut the metamorphic pyroxenite, which in turn cuts the country rock; the pocket type where mica, and sometimes apatite, are segregated in clusters or pockets in pyroxenite which pinch and swell; and thirdly, the contact type where mica occurs on the contact of pyroxenite and country rock, often gneiss or marble.

Several varieties of metamorphic pyroxenite deposits are illustrated in the accompanying figures from de Schmid (1912). Figure 1 is the Freeburn mine in lot 3, concession VII, Loughborough township, Frontenac county. The pyroxenite dike cuts gneiss and carries vein-like leads of phlogopite, apatite and calcite.

Figure 2 is a mica deposit in lot 14, concession VIII, Loughborough township, Frontenac county. The mica and apatite occur in calcite veins in pyroxenite.

Figure 3 is a mica-apatite deposit in lot 14, concession VIII, Loughborough township, Frontenac county. A coarsely crystalline calcite vein carrying mica and apatite cuts pyroxenite and crystalline limestone. Some mica occurs along the vein contact in the crystalline limestone.

Figure 4 is the Amey mine in lot 13, concession VIII, Loughborough township, Frontenac county. The country rock is gneiss; the main ore bodies are calcite carrying mica and apatite. The calcite is enclosed in pyroxenite which in turn is margined by augite syenite.

Figure 5 is a mica-apatite deposit in lot 9, concession V, North Burgess township, Lanark county. The country rock is gneiss cut by veins of metamorphic pyroxenite which carries irregular, branching, pockety leads of mica with minor apatite.

Figure 6 is a mica-apatite deposit in lot 3, concession VIII, North Burgess township, Lanark county. The mica-apatite vein occurs in metamorphic pyroxenite which is margined by a granitic rock. The banded complex cuts gneiss country rock.

Figure 7 is a mica deposit in lot 2, concession IV, South Sherbrooke township. This is a contact deposit with mica occurring in marble along the contact of metamorphic pyroxenite in branching form.

Figure 8 is a sectional view of Currie's typical mineral relationships in a mica-apatite deposit (Currie 1951, p. 774).

The zonal sequence of country rock-metamorphic pyroxenite -calcite with apatite and mica is noteworthy and characteristic of many of these deposits. Phlogopite and apatite are almost invariably associated in the metamorphic pyroxenite type of deposit, but occasionally apatite or mica will predominate to the exclusion of the other. The phlogopite-apatite deposits occur in veins, pockets or marginal to the metamorphic pyroxenite.

Mineralogy

The essential minerals present in the metamorphic pyroxenite type of deposit are pyroxene, phlogopite, calcite and apatite. Common accessory minerals are pyrite, pyrrhotite,

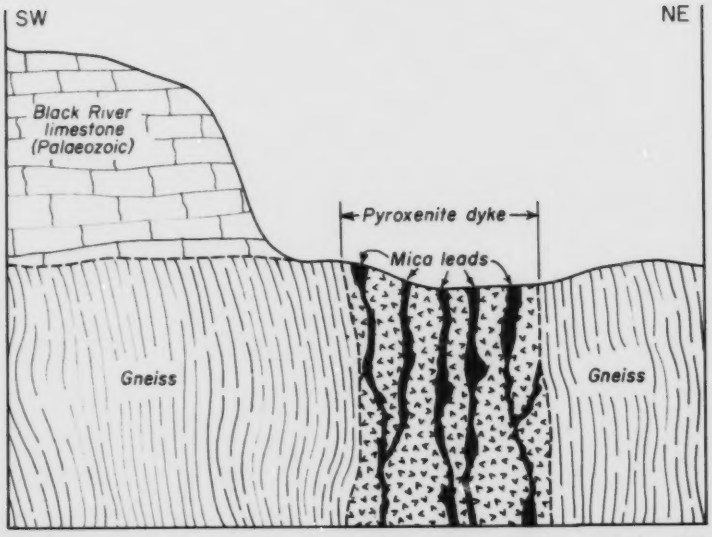

Figure 1- Section through mica deposits at Freebern mine, lot 3, concession VII, township of Loughborough. (After de Schmid 1912.)

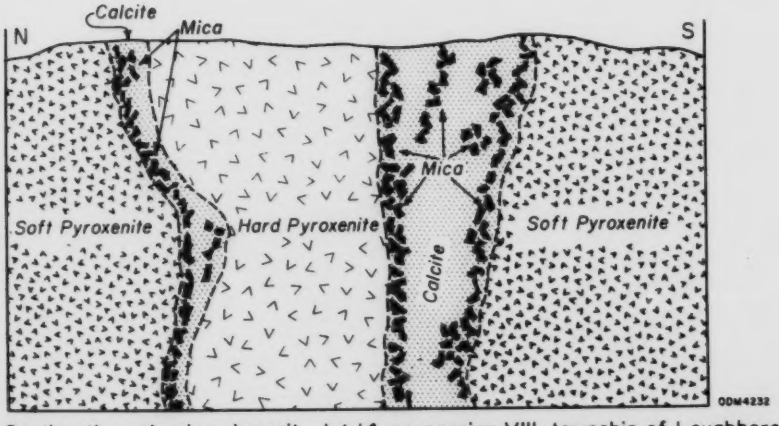

Figure 2- Section through mica deposit, lot 14, concession VIII, township of Loughborough. (After de Schmid 1912).

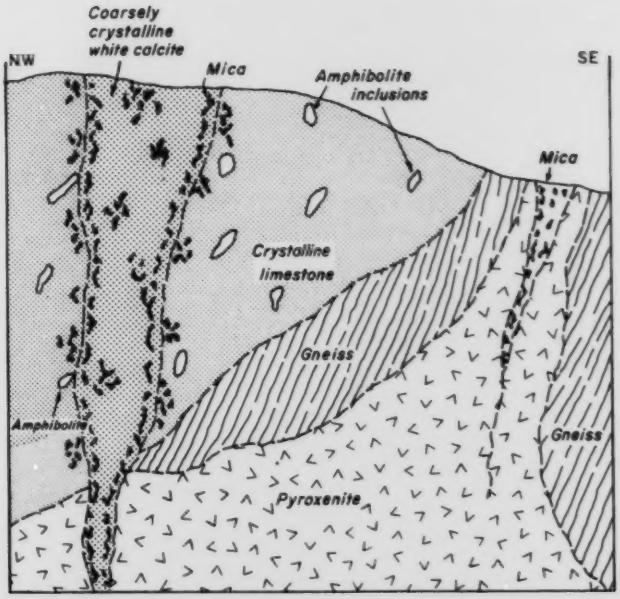

Figure 3 – Schematic section through mica deposits, lot 14, concession VIII, township of Loughborough. (After de Schmid 1912.)

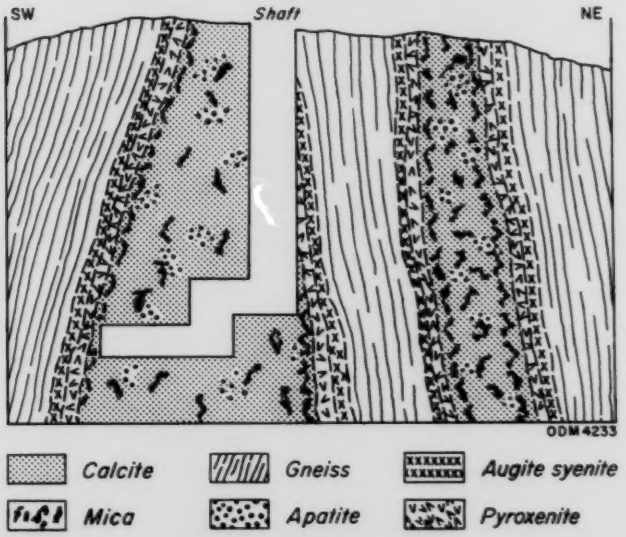

Figure 4 – Section through mica deposit at Amey mine, lot 13, concession VIII, township of Loughborough. (After de Schmid. 1912.)

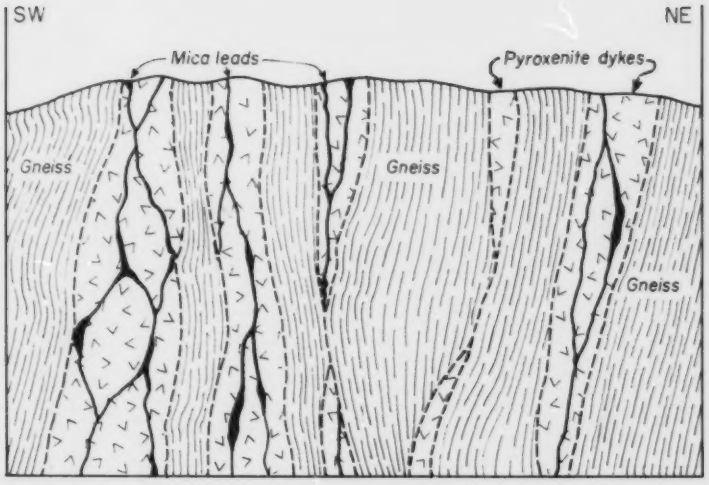

Figure 5-Section through mica deposit, lot 9, concession V, township of North Burgess, showing system of parallel pyroxenite dykes with mica leads. (After de Schmid 1912.)

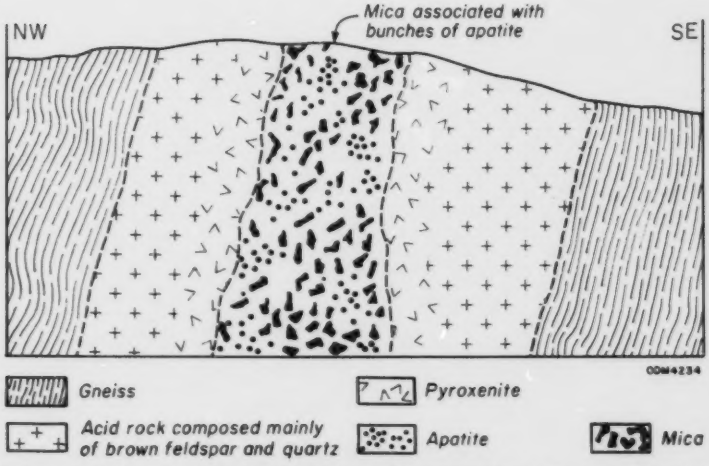

Figure 6-Section through mica deposits, lot 3, concession VIII, township of North Burgess. (After de Schmid 1912.)

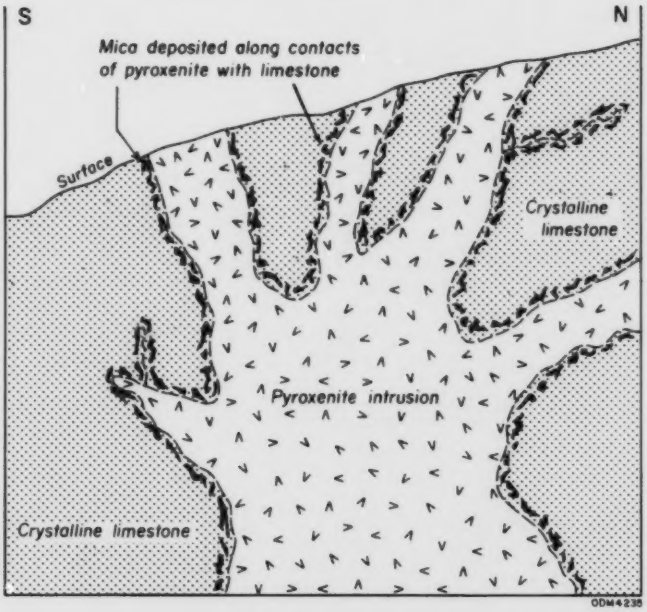

Figure 7- Schematic section through mica deposit, lot 2, concession IV, township of South Sherbrooke. (After de Schmid 1912)

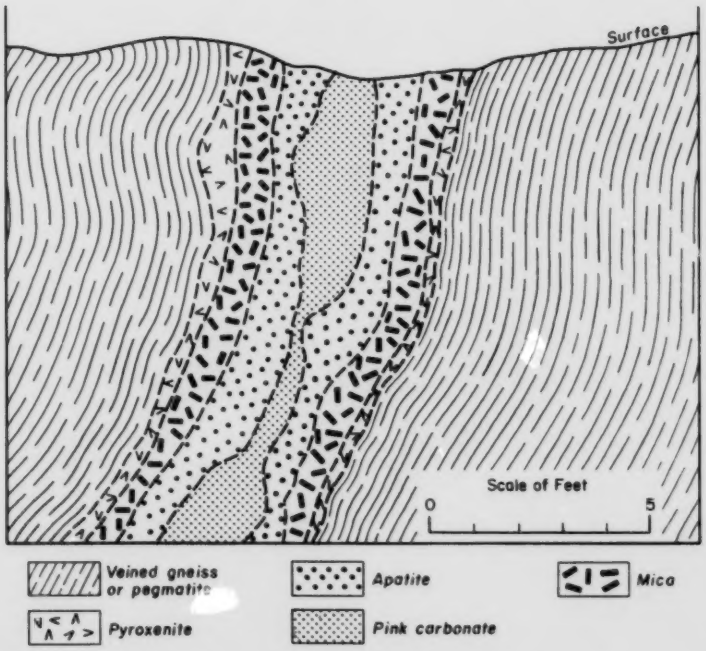

Figure 8- Sectional view of mineral relationships in a mica-apatite deposit. (After J. B. Currie.)

scapolite and hornblende. Minor accessory minerals which may or may not be present are listed by Spence (1929, p. 46) as follows: Actinolite, albite, allanite, anhydrite, barite, chabazite, chalcopyrite, chlorite, datolite, epidote, faujasite, fluorite, galena, garnet, goethite, graphite, hematite, magnetite, microcline, molybdenite, natrolite, olivine, orthoclase, prehnite, quartz, rensselaerite, rutile, serpentine, specularite, sphalerite, spinel, steatite, titanite, tourmaline, tremolite, vesuvianite, wilsonite, zircon.

The origin of metamorphic pyroxenite deposits is discussed by Hewitt (1967b, p. 18).

There follows a short summary description of 160 Ontario phlogopite deposits.

DESCRIPTIONS OF DEPOSITS

FRONTENAC COUNTY

BEDFORD TOWNSHIP

Mrs. Katharine Fitzgerald

Location: Lot 8, concession I, Bedford township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, feldspar, pyrite, quartz, calcite, tourmaline.

Development: A shaft 20 to 25 feet deep.

Geology: Books of phlogopite up to 6 inches in size occur in mica pyroxenite cutting pegmatite and granite gneiss.

Reference: Harding (1947, p. 80).

F. Judge Farm

Location: Lot 4, concession II, Bedford township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, apatite.

Development: Shaft 40 feet deep. The first work was carried out early this century by A. Martin in search of phosphate. Additional work was done by John Bragg and by Dick Wilson who produced a small quantity of scrap mica.

Geology: A one foot wide mica-bearing vein cuts pinkish paragneiss which strikes N27°E and dips 30 to 60° SE.

Reference: Harding (1947, p. 80).

Thirty Island Lake Mine

Location: South half of lot 5, concession II, Bedford township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, calcite, feldspar, quartz, pyrrhotite, molybdenite, apatite.

Development: The mine was worked by open stopes from a shaft 214 feet deep. The mine was opened in 1896 by F. Folger. It was worked in 1908 and 1909 by S. Orser of Verona, and in 1910 by Mr. McDonald

of Toronto. It was later worked by Canada Mica Company. From 1942 to 1945 it was worked by the Kingston Mica Mining Company under the direction of C.B. Keller. From 1948 to 1950 it was worked by Ontario Mica Mines Limited under the direction of R.B. Rochester. From 1931 to 1950 the mine produced a total of 1240 tons of mica valued at $89,224.

Geology: Mica bearing pyroxenite veins cut crystalline limestone. The main vein strikes northwest and dips northeast at about 70 degrees. The vein width ranges from a foot to more than 10 feet. The vein branches at the 85-foot level.

References: de Schmid (1912, p. 156); Harding (1947, p. 80).

Mrs. Edith Lunn

Location: South half of lot 31, concession II, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Development: A pit 10 feet deep. Early in this century a pit was sunk by W. Whalen of Westport. About 1924 additional work was carried out by E. Campsall of Godfrey, and F. Orser of Verona. In 1942 William Green of Perth Road recovered some mica from the pit.

Geology: A one-foot wide mica vein cuts gabbro-anorthosite. The mica books are up to 4 inches in size.

Reference: Harding (1947, p. 83).

Mrs. Florence Hoppins

Location: Lot 1, concession III, Bedford township, Frontenac county.

Minerals Present: Phlogopite, pyroxene.

Development: A pit 8 feet deep was sunk on a small mica vein about 1937 or 1938 by Ross Morey. Additional work was done in 1944.

Geology: A small mica-bearing vein occurs at the contact of coarse crystalline limestone and granite. The vein strikes N45°E. The showing did not appear to be of commercial importance.

Reference: Harding (1947, p. 84).

Lenshner Brothers Mine

Location: Lot 15, concession III, Bedford township, Frontenac county, on the farm of Walter Hastings.

Minerals Present: Phlogopite.

Development: A shallow pit 3 feet deep and 12 feet in diameter has been sunk in dark mica schist containing bands of crystalline limestone.

Geology: The mica is confined largely to disseminations in crystalline limestone.

Reference: Harding (1947, p. 84).

Lot 32, Concession III

Location: Lot 32, concession III, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Reference: Spence (1929, p. 72).

D. Thompson Farm

Location: Lot 17, concession IV, Bedford township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, magnetite, calcite.

Development: Pit and shaft 25 feet deep in crystalline limestone. The property was first opened about 1896 by E. Smith of Prescott and was worked in 1898 by Mr. Ferguson of Kingston. In 1905 work was carried out by Williams and Adams of Toronto.

Geology: The mica is in a narrow pyroxenite dike of light grey-green colour which forms a band between gneiss and crystalline limestone. The mica occurs in coarse calcite.

References: de Schmid (1912, p. 157), Harding (1947, p. 84).

Goods Island

Location: Lot 25, concession IV, Bedford township, Frontenac county; Goods Island, Bobs Lake.

Minerals Present: Phlogopite, pyroxene.

Development: A shallow pit.

Geology: Mica occurs in a small vein in pyroxene rock. The country rocks are greywackes.

Reference: Harding (1947, p. 84).

Geo. Bertrim Farm

Location: Lot 31, concession IV, Bedford township, Frontenac county; three chains west of Crow Lake.

Minerals Present: Phlogopite.

Development: Prospect pit 20 feet deep produced 4 barrels of amber mica in 1905.

Reference: Harding (1947, p. 84).

G. S. Anderson

Location: Lot 32, concession IV, Bedford township, Frontenac county; a few feet from the east shore of Crow Lake.

Minerals Present: Phlogopite, calcite, pyroxene, apatite, tourmaline.

Development: In 1940 C. Orser of Verona sank a 12 foot pit on the mica vein. More than one ton of mica was produced in 1940 and 1941, some of scrap quality.

Geology: A one foot mica vein cuts steeply folded highly altered greywackes; the largest books of mica were from 4 to 5 inches in diameter. Much of the mica was creased and folded.

Reference: Harding (1947, p. 85).

Sangster Lake

Location: Lot 9, concession V, Bedford township, Frontenac county; northeast of Sangster Lake.

Minerals Present: Phlogopite.

Development: Old mica workings sunk in the past century by Joseph Bawden of Kingston are exposed northeast of Sangster Lake.

Reference: Harding (1947, p. 85).

W. W. Lee

Location: Lot 13, concession V, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Development: In 1934 W.W. Lee and son of Bedford Mills produced 320 tons of scrap valued at $2,855 and 2,400 pounds of trimmed mica valued at $480.

Lot 15, Concession V

Location: Lot 15, concession V, Bedford township, Frontenac county.

Minerals Present: Phlogopite, apatite, calcite, pyroxene, pyrite, hornblende, quartz.

Development: The property has been worked as early as 1898 by Frontenac Mining Company, J. and J. Stoness and P. and W. Murphy of Fermoy. The mine was last worked by Dick Wilson of Desert Lake who reported production of 2 barrels of scrap mica. There is an open cut 75 feet long and 60 feet deep.

Geology: A pyroxenite dike carrying a lead of dark amber mica and green phosphate strikes NE-SW and dips 38°SE. The mica crystals are of medium size

and split readily, some being crushed near the surface.

References: de Schmid (1912, p. 158), Harding (1947, p. 85).

P. Burns

Location: Lot 26, concession V, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Development: A pit 5 feet deep was sunk in 1943 and 1944 by P. Burns within 100 feet of Green Bay of Bobs Lake.

Geology: The mica vein cuts folded crystalline limestone.

Reference: Harding (1947, p. 85).

Hilliard Bedore

Location: Lot 34, concession V, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Development: Prospect pit 8 feet deep was sunk on a mica vein by Hilliard Bedore in 1943.

Reference: Harding (1947, p. 86).

Bobs Lake or Taggart Mine

Location: Lot 30, concession VI, Bedford township, Frontenac county; on the south shore of Mud Bay of Bobs Lake.

Minerals Present: Phlogopite, apatite, calcite, pyroxene, feldspar, quartz, pyrite, tourmaline, scapolite, datolite.

Development: Earliest mining was carried out in 1891 by the Montreal Mining Company for phosphate. The first mica was produced by Tom Taggart of Westport in 1897. In 1903 the property was acquired by Kent Brothers and Stoness who operated until 1925. From 1945 to 1948 some mica was produced by C. Orser and Damon Smith. From 1907 to 1928 1949 tons of mica valued at $175,598 were produced. Several open cuts on parallel veins were opened up. The Taggart pit is reported to be 125 feet deep.

Geology: The phlogopite associated with apatite and pink calcite occurs in fissures in green pyroxenite. The fissures average 2 feet wide, strike NW-SE and dip 78°NE. They occur at intervals of 8 to 15 feet and form a series of parallel leads. The vein walls are sometimes lined with pyroxene and scapolite crystals. Many of the veins narrow with depth. The pyroxenite dikes cut paragneiss.

References: de Schmid (1912, p. 159), Harding (1947, p. 86).

Warfel Mine

Location: Lot 5, concession VII, Bedford township, Frontenac county; on the south shore of a peninsula in Kingsford Lake.

Minerals Present: Phlogopite, calcite, apatite, pyroxene, pyrite.

Development: W. Warfel sunk an inclined shaft at least 30 feet deep early in this century.

Geology: A phlogopite-bearing calcite vein dips parallel with the Grenville crystalline limestone and paragneiss and ranges from 1 to 3 feet in width. The largest mica books exposed in the shaft were 2 to 3 inches in diameter.

Reference: Harding (1947, p. 87).

Robinson Mine

Location: Lot 19, concession VII, Bedford township, Frontenac county.

Minerals Present: Phlogopite, calcite, apatite, pyrite, pyrrhotite, titanite.

Development: Several small pits were put down, the largest being 15 feet deep. The mine was worked by McIntyre and McBelton in 1908 and Adams and Stoness in 1909.

Geology: The mica lead is 4 feet wide and occurs at the contact of pyroxenite and marble striking NE-SW.

Reference: de Schmid (1912, p. 160).

Tett Mine

Location: Lot 4, concession VIII, Bedford township, Frontenac county.

Minerals Present: Phlogopite, calcite, apatite, pyrite, pyrrhotite.

Development: Several pits were put down on parallel leads. The deepest pit was 95 feet. The mine was operated in 1899, 1900, 1902, 1907, 1908, 1913 and 1924 with a total production of 99 tons of mica valued at $27,279.

Geology: The mica lead strikes N30°W and dips 78°W and cuts metamorphic pyroxenite which cuts red granite gneiss.

Reference: de Schmid (1912, p. 160).

Lot 6, Concession VIII

Location: Lot 6, concession VIII, Bedford township, Frontenac county; 10 to 15 chains south of the west end of Devil Lake.

Minerals Present: Phlogopite, pyroxene, apatite, feldspar, calcite, epidote, quartz, scapolite.

Development: Numerous surface pits, the deepest of which is 40 feet. The mine was operated by Connors and Daley, then by Stoness and Kent, and later, in 1910, by S. Orser. Some mica was produced.

Geology: The mica occurs in pockets and fissures along the contacts of pyroxenite dikes with red granite gneiss. The pyroxenite bodies vary from a few inches to 15 feet in width.

References: de Schmid (1912, p. 161), Harding (1947, p. 88).

E. Fitzgerald

Location: Lot 9, concession VIII, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Development: A pit 22 feet deep has been sunk. The pit was opened about the beginning of the century on the farm of James Fitzgerald. Some mica was produced.

Geology: The country rock is Grenville marble intruded by gabbro and granite.

Reference: Harding (1947, p. 88).

Antoine Mine

Location: East half of lot 7, concession IX, Bedford township, Frontenac county; on the southeast shore of the west arm of Big Devil Lake.

Minerals Present: Phlogopite, calcite, pyroxenite.

Development: A pit 65 feet deep, 70 feet long and 20 feet wide was opened. The first work was done by T. Taggart in 1895. Subsequently it was worked by Webster and Jones, Mr. Lewis and in 1906 and 1907 by Kent Brothers. In 1906, 27 tons of mica valued at $8,000 were produced.

Geology: The phlogopite occurs in a white calcite vein in metamorphic pyroxenite. The lead has an average width of 4 feet and strikes NW-SE with a dip of 75°SW.

Reference: de Schmid (1912, p. 161).

Geo. Butterill

Location: Lot 19, concession IX, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Development: Prospect pit 4 feet deep sunk early in present century by B. Botting.

Reference: Harding (1947, p. 88).

W. H. Patterson

Location: Lots 20 and 21, concession IX, Bedford township, Frontenac county.

Minerals Present: Phlogopite, calcite.

Development: Pits were sunk by W.H. and Andrew Patterson in 1942 and 1943 on two mica showings. The deepest pit is 25 feet long and 15 feet deep.

Geology: The phlogopite mica veins have a matrix of calcite and cut marble, paragneiss and quartzite of the Grenville Series. The veins range from a few inches to 2 feet wide and carry books of mica as large as 4 inches in diameter.

Reference: Harding (1947, p. 89).

Geo. Green

Location: Lot 2, concession XI, Bedford township, Frontenac county.

Minerals Present: Phlogopite.

Development: A pit was put down in 1920 by George Green of Perth Road, and 2756 pounds of mica valued at $2,676 were produced.

Lot 10, Concession XI

Location: Lot 10, concession XI, Bedford township, Frontenac county.

Minerals Present: Phlogopite, pyrrhotite, calcite.

Development: The property was owned by W. Poole of Freeland and was operated intermittently by various parties from 1892 to 1910. There is a pit 20 feet deep.

Geology: The phlogopite occurs in crystals up to 5 inches in size in white calcite with abundant pyrrhotite cutting pyroxenite and quartz. The mica leads are irregular pockety fissures.

Reference: de Schmid (1912, p. 161).

Stoness Mine

Location: East half of lot 4, concession XIII, Bedford township, Frontenac county.

Minerals Present: Phlogopite, calcite, apatite.

Development: The mine was first worked in the 1870's by J.M. Stoness for phosphate, and later by Kent Brothers and Stoness for mica. The mine operated intermittently until 1905. There is an inclined shaft 450 feet deep flattening from 42° at surface to 20° at the bottom. The shaft is 15 feet wide and 30 feet high.

Geology: The vein of phlogopite in calcite and apatite has an average width of ten feet and occurs at the contact of pyroxenite and red granite gneiss. The mica is an excellent light silver amber of medium size.

Reference: de Schmid (1912, p. 162).

J. Smythe

Location: Lot 6, concession XIII, Bedford township, Frontenac county.

Minerals Present: Phlogopite, calcite, pyroxene.

Development: The mine was opened by J. Smythe in 1899 and operated intermittently for several years. The main pit is 25 feet deep, with a drift running southeast from the bottom of the pit.

Geology: A calcite vein between pyroxenite walls carries phlogopite mica especially on its margins. The veins strike NW-SE and are of irregular width. The main vein is 15 feet wide narrowing to a few inches. The mica is of poor quality due to calcite inclusions.

Reference: de Schmid (1912, p. 163).

HINCHINBROOKE TOWNSHIP

Hugh Hickey

Location: Lot 1, concession I, Hinchinbrooke township, Frontenac county.

Minerals Present: Biotite.

Development: Several prospect pits.

Geology: Biotite in pink granite pegmatite of no commercial value.

Reference: Harding (1947, p. 77).

Campbell and Folger Mine

Location: Lot 27, concession II, Hinchinbrooke township, Frontenac county; one quarter mile northeast of the southeast arm of Eagle Lake.

Minerals Present: Phlogopite, calcite.

Development: 5 pits, the largest of which is 20 feet long, 6 feet wide and 12 feet deep. The pits are reported to have been sunk by Tom Duffy between 1905 and 1910. Some mica was produced. Additional work was done in 1921 by H.J. Cain.

Geology: Veins of calcite carrying phlogopite are exposed in the pits and cut Grenville paragneiss.

Reference: Harding (1947, p. 78).

D. J. Howes

Location: Lot 28, concession II, Hinchinbrooke township, Frontenac county; 12 chains east of Eagle Lake.

Minerals Present: Phlogopite, apatite, calcite, actinolite, pyroxene, hornblende.

Development: Six pits were put down, the deepest of which was 20 feet. The property was worked in 1898 by B. Folger of Kingston, who extracted 3 tons of rough mica. In 1908 some phosphate was produced by J. Richardson of Kingston. In 1921 some mica was produced by Harry J. Cain.

Geology: Mica occurs in calcite-pyroxene-apatite veins cutting Grenville marble and paragneiss cut by granite.

Reference: Harding (1947, p. 78).

W. Campsall

Location: Lot 30, concession II, Hinchinbrooke township, Frontenac county; on a point on the south shore of a northwest bay of Eagle Lake.

Minerals Present: Phlogopite.

Development: Mica was recovered during the early 1900's by Wesley Campsall of Tichborne from a pit within a few feet of the shore of Eagle Lake.

Reference: Harding (1947, p. 78).

Godfrey Mine

Location: North half of lot 1, concession III, Hinchinbrooke township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, apatite.

Development: The workings consist of numerous pits and trenches, and a vertical shaft 60 feet deep, put down along a zone which strikes northeastward for about 300 feet. Mica mining was commenced during the latter part of the last century by Chester H. Godfrey. Some work was done in 1940 and 1941 by S. Orser of Verona.

Geology: Phlogopite-bearing pyroxenite dikes cut northeastward striking granite gneisses.

Reference: Harding (1947, p. 78).

William Green

Location: Lot 30, concession III, Hinchinbrooke township, Frontenac county; about 250 feet from a northwest arm of Eagle Lake.

Minerals Present: Phlogopite.

Development: Several shallow pits were put down on mica veins. The veins were worked in 1942 by William Green of Perth Road. One pit was 8 feet deep.

Geology: Mica-bearing veins ranging in width from 1 to 2 feet strike a little east of south and dip steeply southwest. The veins cut granite gneiss and paragneiss.

Reference: Harding (1947, p. 79).

Eugene Dillon

Location: Lot 4, concession X, Hinchinbrooke township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, calcite.

Development: A pit 25 feet long and 15 feet deep was sunk between 1920 and 1930 by Dick Wilson. A small quantity of mica was recovered.

Geology: A calcite-mica vein about 1½ feet wide was exposed in the pit. It cuts marble close to a granite contact.

Reference: Harding (1947, p. 79).

LOUGHBOROUGH TOWNSHIP

Lot 1, Concession VII

Location: West half of lot 1, concession VII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Development: Produced 1,000 pounds of mica valued at $25 in 1899.

Reference: Statistics Office, Ontario Department of Mines.

Freeburn Mine

Location: West half of lot 3, concession VII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, calcite, pyroxene, pyrite.

Development: The workings consist of 4 pits, the largest being 64 feet deep, 30 feet long and 20 feet wide. The mine belonged to Freeburn Brothers and was worked by F. Foxton from 1890 for about 15 years. In 1907 the Sydenham Mining Company carried out some work.

Geology: The widest mica lead was about 2½ feet wide in green pyroxenite and carried a pink calcite filling. The veins are parallel and strike W15°N. The mica is a wine-amber of good quality and medium size.

Reference: de Schmid (1912, p. 144).

Lot 4, Concession VII

Location: Lot 4, concession VII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Development: 30 tons of mica valued at $12,000 were produced in 1900, by James Foxton of Sydenham.

Reference: Statistics Office, Ontario Department of Mines.

Lacey Mine

Location: Lot 11, concession VII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, pyroxene, pyrite, calcite.

Development: This was the largest phlogopite mica mine in Canada and produced intermittently from 1880 to 1947. It was acquired by the General Electric Company in 1894, and was worked under lease by Webster and Company, and Mr. J.W. Trousdale of Sydenham. The General Electric Company then operated under the name of the Loughborough Mining Company. Total production in the years 1900, 1902-1927 and 1947, was 5781 tons valued at $827,756.

Spence (1929, p. 69) describes the workings as follows: "the deposit was originally worked from a shaft, 185 feet deep, with drifts run at 22-foot intervals along the vein. The longest drift was on the fourth level, this being carried 150 feet to the southeast and 65 feet to the northwest, a total of 215 feet. A crosscut was also driven 60 feet to the southwest on this level, to pick up a parallel vein which was followed by drifts for a distance of 160 feet to the southeast. From the second level, a crosscut to the northeast encountered a third vein at 55 feet, and this was followed for 80 feet to the southeast."

"Later, it was decided to glory-hole the workings, and a large open pit, 60 by 70 feet, was sunk upon the main and northeast parallel veins. Most of the work in recent years has been carried out from this excavation, and has consisted in drawing the pillars and caving the ground between the old stopes, the mica being recovered during mucking operations. In 1923, a new shaft was sunk south of the main shaft to a depth of 180 feet."

Geology: Phlogopite mica occurred in veins and pods in metamorphic pyroxenite. The main vein strikes NW-SE and dips vertically. In width the lead varies from a few inches to 25 feet, being, in some places, a solid mass of large mica crystals. One of the largest mica crystals from the mine measured over 9 feet in diameter. The country rock is gneiss and mica schist.

References: de Schmid (1912, p. 141), Spence (1929, p. 69).

Bennett Mine

Location: Lot 12, concession VII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Development: In 1922 H.V. Bennett produced 166 tons of mica valued at $1,660.

Reference: Statistics Office, Ontario Department of Mines.

Camp Cozey Mine

Location: Lot 6, concession VIII, Loughborough township, Frontenac county; three miles north of Sydenham.

Minerals Present: Phlogopite, calcite, pyroxene.

Development: First operated by F.E. Benjamin of Yarker in 1900, then by Scriven and White in 1910; then by A.G. Martin in 1923. Total production was 103 tons valued at $49,701. A shaft 8 feet by 5 feet was sunk 80 feet vertically, then 40 feet on an incline.

Geology: Medium-sized wine amber mica, sometimes somewhat crushed, occur in a mica lead in green pyroxenite. The lead strikes NE-SW, dips vertically to the 80-foot level, where it assumes almost a horizontal position for 25 feet, then becomes vertical again. The maximum width of the lead is 13 feet at 70-foot depth.

Reference: de Schmid (1912, p. 145).

Foxton Mine

Location: Lot 7, concession VIII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Development: Sydenham Mica and Phosphate Mining Company produced 1690 pounds of mica valued at $179 in 1917.

Reference: Statistics Office, Ontario Department of Mines.

Folger Mine

Location: Lot 8, concession VIII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Reference: Spence (1929, p. 71).

Hugh Stevens Mine

Location: North half of lot 10, concession VIII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Development: In 1913 the Dominion Mineral Exploration Syndicate produced 16,420 pounds of mica valued at $4,352. In 1914 Frontenac Mica Company Limited produced 5,085 pounds of mica valued at $564.

Reference: Statistics Office, Ontario Department of Mines.

Freeman Mine

Location: Lots 12, 13, 14, concession VIII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, calcite, apatite, pyroxene.

Development: This property was first worked in 1899 by Webster and Company, under lease from P. Freeman of Sydenham, who subsequently worked intermittently for three or four years. James Richardson and Sons of Kingston then bought the mine and worked for 3 years, after which it was acquired by the New York and Ontario Mining Company who carried on one year's mining. S.H. Orser worked the mine in 1909.

The deepest pit is down 80 feet. The workings follow the leads for a distance of over 1,000 feet.

Geology: Dark mica is found with red calcite and green apatite in calcite veins. The mica leads strike N75°W. The country rock is reddish gneiss and marble.

Reference: de Schmid (1912, p. 146).

Amey Mine

Location: East half of lot 13, concession VIII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, calcite.

Development: The mine was opened in the 1870's for phosphate by N. Amey of Perth Road; it was subsequently worked by Webster and Company. In 1908 the company was sold to Loughborough Mica Company. Production from 1899 to 1904 amounted to 85 tons valued at $15,872. Numerous pits exist on

the property and range from 20 to 100 feet deep. The main shaft was sunk vertically for 80 feet, from which point a drift was run 12 feet to the northwest, further sinking then being carried out to 100 feet. A drift was carried along the vein at the bottom of the shaft for a distance of 50 feet and a crosscut was run 45 feet to the southwest to pick up the footwall without success, being in pink calcite all the way.

Geology: A series of 7 parallel calcite-mica leads cut green metamorphic pyroxenite. The leads are 12 to 20 feet apart. The veins are narrow at the surface and widen at depth to upwards of 45 feet. The veins strike NW-SE.

Reference: de Schmid (1912, p. 148).

C. Martin

Location: Lot 1, concession IX, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Development: A pit 25 feet deep was sunk on a mica lead cropping through an overlying strata of conglomerate and sandstone.

Reference: de Schmid (1912, p. 149).

Lot 6, Concession IX

Location: Lot 6, concession IX, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite.

Development: An old phosphate property worked many years ago

by Smith and Lacey of Sydenham. Webster and Company also carried out some work.

Geology: The country rock is pink granite gneiss.

Reference: de Schmid (1912, p. 149).

J. W. Trousdale

Location: Lot 7, concession IX, Loughborough township, Frontenac county.

Minerals Present: Apatite, phlogopite.

Development: Formerly mined for phosphate and mica.

Reference: de Schmid (1912, p. 149).

N½ Lot 9, Concession IX

Location: North half of lot 9, concession IX, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, calcite, pyroxene.

Development: The property was worked on a small scale in 1907 by Snook and Freeman of Verona, being subsequently acquired by Reamer and Solliday of Sydenham. There are six pits on the property, the deepest being down 35 feet.

Geology: A fissure vein carrying phlogopite, white calcite and apatite cuts green pyroxenite near the contact of reddish granite gneiss.

Reference: de Schmid (1912, p. 149).

Arcade Mine

Location: Lot 12, concession IX, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, white calcite.

Development: The mine was worked by the Arcade Mining Company in 1907 and 1909 and 3,000 pounds of thumb-trimmed mica was produced. The deepest pit was down 20 feet.

Geology: Parallel fissure veins of calcite carrying mica and apatite strike NE-SW.

Reference: de Schmid (1912, p. 150).

Baby Mine

Location: Lot 1, concession X, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, quartz, actinolite, tremolite, chlorite, tourmaline, pyrite.

Development: Operated by Richardson and Ellerbeck in 1909 and 1910, producing 74 tons of mica valued at $19,535. A series of pits were sunk at intervals of 15 to 20 feet along the lead. The deepest pit is down 70 feet.

Geology: The mica lead averages 4 feet in width and cuts pyroxenite. The lead strikes N-S and dips vertically. It can be traced for over one-half mile.

Reference: de Schmid (1912, p. 150).

Birch Lake Mine

Location: South half of lot 6, concession X, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, calcite, pyroxene, pyrite.

Development: The mine was first opened in the 1880's for phosphate by T. Holland of Sydenham. Subsequently the property was acquired by Smith and Lacey and mined for mica and phosphate. The mine was later worked by Webster and Company. In April 1910 the Birch Lake Mining Syndicate took over the property and pumped out the main pit which was 115 feet deep, 12 feet wide and 100 feet long. Another pit was sunk to 110 feet on a parallel lead. In 1912 and 1913, nine tons of mica valued at $3,460 were produced.

Geology: A fissure vein of mica, calcite and apatite cuts pyroxenite. The vein strikes N-S and is almost vertical. The average width of the mica lead is 3 feet at the north end of the pit, and 8 feet at the south end of the pit.

Reference: de Schmid (1912, p. 152).

E½ Lot 7, Concession X

Location: East half of lot 7, concession X, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite.

Development: The mine was an old phosphate producer later worked by Webster and Company for mica. In 1900 it was acquired by the General Electric Company. There are numerous pits and shafts.

Reference: de Schmid (1912, p. 153).

McClatchey Mine.

Location: Lot 8, concession X, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, pyroxene, calcite, apatite, pyrite.

Development: The mine was worked for phosphate and mica by Gould Lake Mining Co. Ltd. In 1900 it was worked by Fillion and Wood and in 1901 by McClatchey and Haydon of Sydenham. In 1902 it was acquired by J.W. Trousdale who worked the mine in 1902, 1906, 1910 and 1913. G.E. Allard worked the mine in 1911 and 1912. From 1899 to 1913 a total of 167 tons of mica valued at $16,270 was produced. There are several pits and a shaft 100 feet deep.

Geology: The mica occurs in north and south leads cutting grey-green pyroxenite cutting dark gneiss.

Reference: de Schmid (1912, p. 153).

Lot 10, Concession X

Location: Lot 10, concession X, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite.

Development: The mine was first opened by Mr. Sloan of Perth about 1897, and in 1898 was worked by W. Mace of Tamworth. In 1908 Excelsior Mining Co. of Toronto worked for a year. There are 6 pits, the largest of which is 40 feet deep.

Geology: The mica-apatite leads occur in fissures in granite gneiss underlain by pyroxenite.

Reference: de Schmid (1912, p. 153).

Bear Lake Mine

Location: Lot 18, concession XI, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, calcite, pyroxene.

Development: Formerly an old phosphate producer worked by W. Wallace of Perth Road, the mine was acquired by J.H. Roberts of Perth Road in 1900. It operated from 1899 to 1903 producing $3,170 worth of mica. There are a large number of surface pits and an inclined shaft 105 feet deep.

Geology: The mica-calcite-apatite lead is on the contact of pyroxenite and gneiss and strikes NE-SW, the average width of the vein being 12 feet.

Reference: de Schmid (1912, p. 154).

Raymond Mine

Location: Lot 20, concession XI, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite.

Development: Worked by W.H. Raymond and Guthrie of Perth Road in 1900 to produce 2,250 pounds of mica valued at $202. Worked by Kent Brothers and Stoness in 1903. Only a few surface pits have been opened up.

Reference: de Schmid (1912, p. 154).

Buck Lake Mine

Location: Lot 22, concession XI, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Development: The Buck Lake Mining Company under the direction of Henry McCadden of Perth Road in 1917 produced 8 tons of mica valued at $269.

Reference: Statistics Office, Ontario Department of Mines.

Lot 23, Concession XII

Location: Lot 23, concession XII, Loughborough township, Frontenac county.

Minerals Present: Phlogopite.

Reference: Spence (1929, p. 71).

Birch Lake Mine

Location: Lot 14, concession XIV, Loughborough township, Frontenac county.

Minerals Present: Phlogopite, apatite, calcite.

Development: The mine was opened by Mr. McKay of Wisconsin; in the 1890's it was operated by Webster and Company and in 1910 it was taken over by the Birch Lake Mining Syndicate. A shaft was sunk to 75 feet on an 80° incline to the SW.

Geology: Phlogopite and apatite occur in vein fillings with a calcite matrix. The veins cut pyroxenite

and strike NW-SE.

Reference: de Schmid (1912, p. 154).

OLDEN TOWNSHIP

John Ellsworth

Location: Lot 4, concession X, Olden township, Frontenac county.

Minerals Present: Phlogopite, pyroxene.

Development: A pit was put down in 1920 by George Ellsworth and Edward Patterson of Inverary. The pit is 15 feet long, 8 feet wide, and 18 feet deep. Some mica was produced.

Geology: A vein of mica and pyroxene cuts dark-coloured paragneiss.

Reference: Harding (1947, p. 74).

OSO TOWNSHIP

George Clements

Location: Lot 8, concession I, Oso township, Frontenac county.

Minerals Present: Biotite.

Development: A mica prospect pit 9 feet deep is situated 400 feet from the west shore of Hawley Bay of Sharbot Lake. The pit was opened by Chas. Peters in the 1930's. Additional work was done by S. Orser of Verona.

Reference: Harding (1947, p. 74).

D. McCrimmon

Location: Lot 5, concession II, Oso township, Frontenac county.

Minerals Present: Phlogopite.

Development: A mica pit 30 feet long, 10 feet wide and 10 feet deep was sunk on the farm of Dan McCrimmon. Early work was carried out by Oscar and Isaac Campsall about the beginning of the century. Further work was done by William Lee, John Hetherington and John Hollister.

Geology: The country rocks are Grenville paragneiss and marble cut by pegmatite dikes.

Reference: Harding (1947, p. 74).

George Clements

Location: Lot 8, concession II, Oso township, Frontenac county.

Minerals Present: Phlogopite, calcite, pyroxene.

Development: A mica pit 18 feet long and 7 feet deep was put down about 250 feet from the east shore of Hawley Bay of Sharbot Lake. The first work was carried out by William Hawley about 1925. Between 1930 and 1935 additional work was done by C. Stoness of Westport. About a ton of mica was produced.

Geology: A mica-calcite-pyroxene vein about 2 feet wide is exposed in the pit. The largest mica books were 4 inches in diameter and of poor quality. The country rock is pinkish-grey gneiss.

Reference: Harding (1947, p. 74).

Fred Reid

Location: Lot 12, concession IV, Oso township, Frontenac county.

Minerals Present: Biotite.

Development: A shallow mica pit was put down about 250 feet north of Ungava Lake. The country rock is Grenville metasediment. The showing is of no economic importance.

Reference: Harding (1947, p. 75).

Lot 13, Concession IV

Location: Lot 13, concession IV, Oso township, Frontenac county.

Minerals Present: Phlogopite, calcite, apatite, pyroxene, pyrite.

Development: J. Stoness put down 2 pits between 1915 and 1918. One pit is 10 feet square and 15 feet deep, the other is 20 feet long, 5 feet wide and 15 feet deep.

Geology: The mica is in a 4-foot calcite vein cutting Grenville marble and paragneiss.

Reference: Harding (1947, p. 75).

E. Brash

Location: North half of lot 1, concession V, Oso township, Frontenac county.

Minerals Present: Phlogopite or biotite.

Development: The mica pit is 12 feet square and 10 feet deep. The vein has been excavated east of the pit by a trench 30 feet long, 4 feet wide and 5 feet deep. Most of the work was done between 1915 and 1920 by Fred Knight. Some mica was produced.

Geology: The mica vein cuts coarse hornblendite which passes gradually into syenite and diorite.

Reference: Harding (1947, p. 75).

Lot 2, Concession V

Location: Lot 2, concession V, Oso township, Frontenac county.

Minerals Present: Phlogopite, apatite, pyroxene, calcite.

Development: Numerous pits and shafts were put down on this lot during the latter part of the last century in search of phosphate and mica. Early in the present century the property was acquired by the General Electric Company.

Geology: Mica-apatite-pyroxene-calcite veins up to 4 feet wide cut garnet paragneiss and marble of the Grenville Series. Mica books are up to 6 inches in size but much of the mica is creased and wavy.

Reference: Harding (1947, p. 76).

Lot 13, Concession V

Location: Lot 13, concession V, Oso township, Frontenac county.

Minerals Present: Phlogopite, biotite.

Development: 2 pits 4 feet and 8 feet deep reported sunk about 1900 by Tom Webster. A small amount of mica was recovered.

Geology: The mica veins strike across pink gneiss.

Reference: Harding (1947, p. 76).

T. Cooke

Location: Lots 2 and 3, concession VII, Oso township, Frontenac county.

Minerals Present: Phlogopite, calcite, hornblende.

Development: Several pits have been opened, one of which is 30 feet long, and 25 feet deep. The work was initiated by Tom Cooke during the latter part of the nineteenth century. In the 1920's further work was done by F. Asselstine.

Geology: Most of the veins range in width from a few inches to three feet. The veins contain amber mica, pink calcite and hornblende. The largest mica books noted were 5 inches in diameter.

References: de Schmid (1912, p. 163), Harding (1947, p. 76).

Lot 3, Concession VII

Location: Lot 3, concession VII, Oso township, Frontenac county; one quarter mile west of Sucker Lake.

Minerals Present: Phlogopite.

Development: A shallow mica prospect pit in Grenville marble.

Reference: Harding (1947, p. 77).

Ross Gray

Location: Southwest part of lot 12, concession VII, Oso township, Frontenac county.

Minerals Present: Phlogopite.

Development: A pit 50 feet long, 20 feet wide and 10 to 40 feet deep was sunk in the side of a hill early in the twentieth century by Isaac and Oscar Campsall of Tichborne. The largest mica books were about 4 inches in diameter.

Reference: Harding (1947, p. 77).

STORRINGTON TOWNSHIP

Boal Mine

Location: Lot 8, concession XII, Storrington township, Frontenac county.

Minerals Present: Phlogopite.

Reference: Ontario Dept. Mines, Vol. X, 1901, p. 135.

Bawden Mine

Location: Lot 5, concession XIV, Storrington township, Frontenac county.

Minerals Present: Phlogopite, apatite.

Development: Produced 5 tons of mica valued at $180 in 1903.

Reference: Spence (1920, p. 50).

Lot 8, Concession XIV

Location: Lot 8, concession XIV, Storrington township, Frontenac county.

Minerals Present: Phlogopite.

Reference: Spence (1929, p. 71).

Rowan Mine

Location: Lot 9, concession XIV, Storrington township, Frontenac county.

Minerals Present: Phlogopite.

Lot 1, Concession XV

Location: Lot 1, concession XV, Storrington township, Frontenac county.

Minerals Present: Phlogopite, apatite, pyroxene.

Development: The property belonged to Kent Brothers and Stoness who worked it in 1901 and 1902. None of the workings exceed 25 feet in depth.

Geology: Phlogopite and apatite occur in fissure veins in pyroxenite.

Reference: de Schmid (1912, p. 155).

HALIBURTON COUNTY

CARDIFF TOWNSHIP

Dixon Mine

Location: Lot 28, concession XI, Cardiff township, Haliburton county.

Minerals Present: Phlogopite, pyroxene. Phlogopite books 3 to 6 inches in diameter are crushed.

Development: 3 pits about 10 feet deep.

Geology: Pits expose a 2 foot phlogopite-pyroxene dike at the contact between coarse crystalline limestone on the west and medium grained rusty biotite gneiss on the east. The gneissic structure trends N20°E and dips 65°SE.

Reference: Satterly (1943, p. 56).

Lot 7, Concession XXII

Location: Lot 7, concession XXII, Cardiff township, Haliburton county; south side of CN railway line.

Minerals Present: Phlogopite, apatite, calcite, pyroxene. Some books of mica up to 2½ by 2 feet in size reported by Adams and Barlow.

Development: Pit 20 feet in diameter and 18 feet deep.

Geology: Phlogopite in mica pyroxenite.

Reference: Satterly (1943, p. 56).

GLAMORGAN TOWNSHIP

Bear Lake Mine

Location: Lots 33 and 34, concession XIII, Glamorgan township, Haliburton county.

Minerals Present: Phlogopite.

Development: Tory Hill Marble and Mica Co. Ltd.

Production: 3396 pounds valued at $699 between 1918 and 1925.

Reference: Satterly (1943, p. 56).

Lot 28, Concession XV

Location: Lot 28, Concession XV, Glamorgan township, Haliburton county.

Minerals Present: Phlogopite, calcite, apatite, fluorspar.

Development: Two pits 100 feet apart; the northeast pit is 7 by 7 feet and 6 feet deep; the southeast pit is 7 by 7 feet and 12 feet deep.

Geology: A seven foot calcite vein strikes N30°E and dips 70°NW. The walls of the vein consist of an aggregate about 9 inches thick of books of dark mica ranging in size from 3 by 3 inches to 5 by 7 inches. The mica is fractured and of poor quality. The calcite vein also carries apatite and fluorspar. The country rock is a pink biotite granite gneiss with an aggregate of hornblende crystals from 3 to 6 inches in width developed adjacent to the vein.

Reference: Satterly (1943, p. 56).

MONMOUTH TOWNSHIP

Burnt River Mine

Location: Lot 19, concession VI, Monmouth township, Haliburton county.

Minerals Present: Phlogopite.

Development: The Orser-McKenzie Mica Milling Company produced 600 pounds of phlogopite mica valued at $46 in 1927.

Reference: Statistics Office, Ontario Department of Mines.

Lot 13, Concession X

Location: Lot 13, concession X, Monmouth township, Haliburton county.

Minerals Present: Phlogopite, hornblende, pyroxene, clacite, apatite, peristerite.

Development: A pit 10 by 15 feet deep was sunk.

Geology: Mica books up to 10 by 14 inches were observed. The north wall of the pit is composed of an aggregate of phlogopite, hornblende, pyroxene, calcite, apatite and peristerite. The south wall is pink granite pegmatite.

Reference: Satterly (1943, p. 57).

Lot 16, Concession X

Location: Lot 16, concession X, Monmouth township, Haliburton county.

Minerals Present: Phlogopite, apatite, calcite.

Development: Worked about 1900. There is a curved trench 95 feet long, 20 feet wide and 5 to 10 feet deep with a pit 25 feet in diameter and 15 feet deep.

Geology: Phlogopite and apatite occur in a calcite vein. The country rocks are rusty syenite gneiss, serpentine marble, and pegmatite.

Reference: Satterly (1943, p. 57).

Lot 23, Concession XII

Location: Lot 23, concession XII, Monmouth township, Haliburton county.

Minerals Present: Phlogopite, hornblende, apatite.

Development: A pit 12 by 15 feet was put down between 1914 and 1918.

Geology: Mica books up to 5 inches in diameter were found. The country rocks are paragneiss and amphibolite.

Reference: Satterly (1943, p. 58).

Lot 35, Concession XV

Location: Lot 35, concession XV, Monmouth township, Haliburton county.

Minerals Present: Phlogopite, pyroxene, calcite, apatite.

Development: Several trenches were put down: One was 70 feet long, 10 feet wide and 6 to 10 feet deep.

A second trench is 25 feet long, 12 to 30 feet wide and 20 feet deep.

Geology: Veins of phlogopite, pyroxene, calcite and apatite cut biotite-poor gneiss. In places the veins are wholly composed of a crushed aggregate of phlogopite in books up to 10 inches in diameter.

Reference: Satterly (1943, p. 58).

Lot 34, Concession XXII

Location: Lot 34, concession XXII, Monmouth township, Haliburton county.

Minerals Present: Phlogopite.

Development: William Elliott in 1922 produced 27 tons of amber mica valued at $315.

Reference: Statistics Office, Ontario Department of Mines.

HASTINGS COUNTY

FARADAY TOWNSHIP

Bancroft Mica and Stone Products

Location: Lot 31, concession XV, Faraday township, Hastings county.

Minerals Present: Black mica, calcite, apatite, hornblende, albite, fluorite, betafite, pyrite, titanite.

Development: Mica was produced in 1927 by Sydney Orser and from 1946 to 1951 by Bancroft Mica and Stone Products. A total of 469 tons of mica, valued at $28,189, was shipped. In 1953 the property was taken over by Silver Crater Mines Limited

and developed as a uranium prospect. The mica pit measured 45 by 30 feet and was 45 feet deep.

Geology: A carbonate body contained large crystals of black mica up to 4 feet in diameter as well as hornblende, albite, apatite, fluorite, betafite, pyrite, titanite and zircon.

Reference: Hewitt (1957, p. 47).

HERSCHEL TOWNSHIP

Lot 23, Concession III

Location: Lot 23, concession III, Herschel township, Hastings county.

Minerals Present: Phlogopite, calcite, pyroxene.

Development: A pit 15 by 8 feet and 10 feet deep was put down.

Geology: Pyroxene and phlogopite crystals line the walls of a calcite vein cutting marble. The largest mica books exposed are about 4 inches.

Reference: Thomson (1943, p. 59).

Lot 1, Concession IV

Location: Lot 1, concession IV, Herschel township, Hastings county.

Minerals Present: Phlogopite, pyroxene.

Development: Two test pits were put down and a few hundred pounds of mica were removed in 1942.

Geology: Phlogopite occurs in veins and pockets in green pyroxenite which itself occurs as inclusions in pegmatite and granite. Books of phlogopite up to one foot in diameter were taken out. Some of the mica is twisted and warped.

Reference: Thomson (1943, p. 60).

Lot 22, Concession VI

Location: Lot 22, concession VI, Herschel township, Hastings county.

Minerals Present: Phlogopite, pyroxene.

Geology: A small irregular band of pyroxenite is exposed along the north shore of Baptiste Lake and contains a few scattered books of phlogopite with a maximum size of 3 by 6 inches.

Reference: Thomson (1943, p. 60).

MONTEAGLE TOWNSHIP

Lot 18, Concession II

Location: Lot 18, concession II, Monteagle township, Hastings county.

Minerals Present: Phlogopite, pyroxene.

Development: S. Orser mined mica in 1924, shipping about 12½ tons of cobbed mica and 40 tons of scrap mica. The open cut is 75 feet long and 10 feet deep.

Geology: The mica host rock is pyroxenite which is cut by granite and pegmatite.

Reference: Thomson (1943, p. 60).

Lot 1, Concession IX

Location: Lot 1, concession IX, Monteagle township, Hastings county.

Minerals Present: Phlogopite, scapolite, apatite, calcite, titanite, quartz, feldspar.

Development: Some work was done on a dike containing phlogopite, but the quality of the mica was poor.

Reference: Thomson (1943, p. 60).

Ernest Hinze

Location: Lot 22, concession IX, Monteagle township, Hastings county.

Minerals Present: Phlogopite in pyroxenite.

Development: A small pit was put down in pyroxenite.

Geology: Phlogopite sheets up to 4 inches in diameter occur in pyroxenite.

Reference: Thomson (1943, p. 60).

Lot 1, Concession XI

Location: Lot 1, concession XI, Monteagle township, Hastings county.

Minerals Present: Phlogopite in pyroxenite.

Development: Phlogopite is exposed in 4 shallow test pits spaced at intervals over a length of several

hundred feet along the top of a hill near the south end of the lot. Sheets up to 10 inches in length were seen.

Geology: Mica occurs in pyroxenite near a granite contact.

Reference: Thomson (1943, p. 60, 61).

LANARK COUNTY

BATHURST TOWNSHIP

Mendels Mine

Location: Lots 21 and 22, concession II, Bathurst township, Lanark county.

Minerals Present: Phlogopite, pyroxene, calcite, apatite.

Development: The workings consist of two pits a few yards apart, the deepest being down 50 feet and 25 feet long by 8 feet wide. The mine produced $4,000 worth of mica in 1907 under the direction of J.H. Mendels.

Geology: Dark amber mica occurs on northwest and southeast fissure leads in soft, dark pyroxenite. Little calcite or phosphate accompany the mica which is usually of small size.

Reference: de Schmid (1912, p. 185).

Lot 19, Concession IX and X

Location: Lot 19, concession IX and X, Bathurst township, Lanark county.

Minerals Present: Phlogopite.

Reference: Spence (1929, p. 72).

NORTH BURGESS TOWNSHIP

Lot 16, Concession III

Location: Lot 16, concession III, North Burgess township, Lanark county.

Minerals Present: Phlogopite.

Grierson and Gallagher

Location: Lot 3, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite.

Development: An old phosphate property was worked for mica in 1893 by Levett and Davis. The Dominion Improvement and Development Company acquired the mine in 1905 and produced in 1909 and 1916. Edward Smith operated the mine in 1917. In 1939 and 1940 there was some mica production by W.G. Connors and L.J. Smith. Total production in 1916, 1917, 1939 and 1940 was 18½ tons of mica valued at $9,222. The largest pit was 50 feet deep in 1912.

Geology: The mica is dark amber and much crushed, occurring with a little phosphate and calcite on parallel northwest veins.

Reference: de Schmid (1912, p. 164).

Lot 4, Concession V

Location: Lot 4, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite.

Development: An old phosphate mine worked for mica in 1901 by Watts and Noble of Perth. The mine was worked in 1942 and 1943 by Biram Mines Limited and Perth Mica Limited. The workings are about 60 feet from the shore of Big Rideau Lake and consist of half a dozen narrow pits on parallel leads 10 to 15 feet apart. The deepest pit was down 70 feet in 1912. Average width was about 5 feet. Production in 1942 and 1943 amounted to 40 tons of mica valued at $7,193.

Geology: The veins of calcite, mica and phosphate strike E-W to NW and cut pyroxenite which in turn cuts dark gneiss.

Reference: de Schmid (1912, p. 165).

Lot 26, Concession IV

Location: Lot 26, concession IV, North Burgess township, Lanark county.

Minerals Present: Phlogopite.

Nobles Bay Mine

Location: Lots 7 and 8, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, calcite.

Development: The mine was worked in 1907 by J. Rogers. It was later worked by E. Watts and Noble, and Webster and Company. Production in 1903, 1914 and 1917 amounted to 28 tons of mica valued at $9,726. A number of shallow pits were opened, the deepest pit in 1912 was down 50 feet, 5 feet wide and 70 feet long.

Geology: Pockets and leads of silver-amber mica occur in large bodies of pink calcite in a contact zone between pyroxenite and gneiss. The lead has a N-S strike. One vein dips 70°W.

Reference: de Schmid (1912, p. 165).

Smith Mine

Location: Lots 9 and 10, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite, hematite.

Development: The first mica mining began in 1898 by J. Rogers. In 1904 the Dominion Improvement and Development Company acquired the property and began production in 1909. Amber Ridge Mica Company worked the mine in 1942 producing 2½ tons of mica valued at $2,716. There are nine pits varying from 25 to 50 feet in depth.

Geology: Leads of amber mica in calcite with apatite strike NW-SE and cut pyroxenite dikes which in turn cut gneiss. The leads occur at intervals of 15 to 20 feet apart.

Reference: de Schmid (1912, p. 165).

Mahon Mine

Location: Lot 10, concession V, North Burgess township, Lanark county.

Minerals Present: Apatite, phlogopite, pyroxene, calcite.

Development: An old phosphate producer the mine produced mica in 1908 under the direction of J. Mahon of Rideau Ferry and continued intermittently until 1912. The mica workings lie a few hundred feet southwest of the old phosphate pits, on a small gully which has been worn out by water along a line of pockets in dark green pyroxenite. A shaft was sunk to a depth of 30 feet.

Geology: The mica occurs in pink calcite bodies in fissures and pods in green metamorphic pyroxenite. The mica is of good quality, but small in size, the average being 2 by 3 inches. The lead strikes N75°E.

Reference: de Schmid (1912, p. 166).

Blackhall Mine

Location: Lot 11, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite.

Development: The mine was first worked by John Blackhall of Perth in 1898; further work was done in 1899 by J. Stevenson of Toronto. The main pit is 20 by 20 feet in diameter and 30 feet deep.

Reference: de Schmid (1912, p. 167).

Lot 12, Concession V

Location: Lot 12, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite.

Development: Property belonged to Wilson and Greene of Montreal and was worked by Mr. Smith under lease in 1902.

Geology: Mica mined from a pocket.

Reference: de Schmid (1912, p. 167).

Silver Queen Mine

Location: East half of lot 13, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, actinolite, calcite.

Development: First mica mining took place in 1903 by R. McConnell of Ottawa; In 1905 the mine was acquired by the Dominion Improvement and Development Company and mining continued until 1909. The deposit has been mined by three pits, the chief of which lies on the side of a small ridge of gneiss rising some 50 feet above the neighbouring marble. The pit was sunk vertically for 35 feet, from which point an inclined stope has been carried a further 65 feet to the northwest, drifts being run along the deposit in a northeasterly direction. The total length of the excavation is about 60 feet.

Geology: The mica-apatite lead occurs along the contact of a pyroxenite dike with gneiss and crystalline limestone. The strike is N30^{o}E with a dip to the northwest. The mica and phosphate occur as large pockets along the contact. Much of the mica is crushed and twisted.

Reference: de Schmid (1912, p. 167).

Baby Mine

Location: West half of lot 13, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite, scapolite.

Development: The property was leased in 1893 by the Lake Girard Mica System and a pit was sunk to a depth of 100 feet. In 1903 T.J. Smith of Micaville optioned the property. It was later transferred to Kingston Feldspar Mining Company who worked it from 1906 to 1912. Several small pits were opened up. The main pit is 50 feet long.

Geology: A lead of mica and apatite occurs in fissures and pockets in light-coloured pyroxenite cutting gneiss. The main lead widened from 5 feet at the surface to 20 feet at the bottom of the pit. On the northern part of the property pits were sunk on leads of mica and pink calcite.

Reference: de Schmid (1912, p. 168).

Donnelly Mine

Location: Lot 16, concession V, North Burgess township, Lanark county.

Minerals Present: Apatite, mica, pink calcite.

Development: The mine was opened in the 1870's for phosphate. After being closed for many years the mine was leased in 1901 by Gemmell and Thompson of Perth who worked the mine for mica. The mine was later worked by McConnell, Gemmell and Ewen and in 1905 by Thompson and Noonan. The lead is worked over a length of about 150 feet. Several pits have been opened up, the deepest being down 35 feet. The largest pit is 35 feet long and 6

feet wide.

Geology: The lead consists of a calcite vein carrying mica and apatite, and striking NW. The lead is on the contact of pyroxenite and gneiss. The lead at surface was only a few inches wide, but widened to 8 feet at the bottom of the pit.

Reference: de Schmid (1912, p. 169).

Island Wonder or McNally Mine

Location: North half of lot 21, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, white calcite, pyrite, marcasite.

Development: In 1900-1901 McNally Brothers re-opened this mine which had produced years before. In 1900 the production was 36 tons of mica valued at $5,500. Two pits have been sunk on a well-defined vein. The main pit has a depth of 70 feet.

Geology: The calcite vein, carrying mica, pyrite and marcasite, strikes due north and has a width of 3½ feet at the surface.

Reference: de Schmid (1912, p. 169).

Byrnes Mine

Location: Lot 24, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite.

Development: Webb and Rombough of Cardinal mined the property in 1907. A few surface pits were opened on the

contact of pyroxenite and marble, on which light coloured mica crystals of small size occur.

Reference: de Schmid (1912, p. 170).

Haughan Mine

Location: Lot 26, concession V, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, pink calcite.

Development: The property was worked in 1908 by Webb and Rombough. None of the surface pits exceeded 15 feet in depth.

Geology: Amber mica and apatite occur in pink calcite in a fissure deposit in pyroxenite.

Reference: de Schmid (1912, p. 170).

Old Anthony Mine

Location: Lot 10, concession VI, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, pyroxene.

Development: An old phosphate mine worked in 1871 and 1873-4. It was leased in 1906 by Tully and Wilson of Perth. Some of the old workings reached a depth of over 100 feet. The main pit is 70 feet long and has been sunk on an incline of 75° to the southeast following the dip of the deposit.

Geology: The mica and apatite occur on the contact of pyroxenite and red granite gneiss. There is no calcite gangue. The contact strikes N35°E.

Numerous small pits were sunk to the northwest. A sizeable quantity of small-sized books of silver-amber mica was produced.

Reference: de Schmid (1912, p. 170).

Hanlon Mine

Location: Lot 11, concession VI, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite.

Development: This property was one of the principal producers of the district. It was opened in the late 1890's by Webster and Company of Ottawa. They carried out considerable underground work and took out large quantities of mica. They sold out to the General Electric Company in 1901 and this company operated until 1909. The greatest depth reached in the workings was 175 feet, the lead having been stoped out for a distance of 200 feet at the bottom of the pit. The dip of the vein and stope is 75°SE and the greatest width about 20 feet.

Fifty feet north of the main pit, a shaft was sunk in 1899 by Webster and Company to a depth of 35 feet. A large amount of good mica was taken from this opening.

Geology: The mica and phosphate occur in a matrix of calcite in leads striking NE-SW and dipping SE. The leads are at the contact of metamorphic pyroxenite.

Reference: de Schmid (1912, p. 171).

Old Adams or Klondyke Mine

Location: Lot 12, concession VI, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, pink calcite, pyroxene.

Development: The property was originally worked for phosphate. It was idle many years until leased by the General Electric Company in 1901. In 1906 the mine was acquired by Watts and McConnell. It was worked by Watts and Noble in 1907, and later by Rinaldo McConnell. There are a large number of prospect pits and trenches, but none exceeds 40 feet in depth. The main pit is 60 feet long.

Geology: The mica-phosphate-calcite leads strike north and are closely associated with spurs of pyroxenite cutting granite gneiss. The mica is medium amber in crystals of small size.

Reference: de Schmid (1912, p. 172).

Martha Mine

Location: East half of lot 13, concession VI, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite, scapolite.

Development: The property has produced large quantities of phosphate in the early days. It was operated about 1887 for mica by an English syndicate, and in 1891 and 1892 by the Lake Girard Mica System. In 1893 the mine was purchased by the Mica Manufacturing Company of London who worked on and off until 1902. In 1905 Sewell and Smith leased the property. The mine was operated in 1906, 1927, 1941, and 1942. In 1900, 1905, 1906, 1927, 1941 and 1942 a total of 388 tons of mica valued at $18,798 was produced. The main pit is

an open cut part of which forms the Munslow mine.

Geology: Calcite-mica-apatite leads cut narrow pyroxenite bands and strike N20°E.

Reference: de Schmid (1912, p. 172).

Munslow Mine

Location: West half of lot 13, concession VI, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, pink calcite.

Development: The Munslow open pit adjoins and forms part of the open pit of the Martha mine. Both mines were originally opened for phosphate. The Munslow mine was first exploited for mica in 1891 by T.J. Smith of Micaville. The mine was worked until about 1907. In 1940 there was production of 14 tons of mica valued at $5,809. The main pit on the Martha and Munslow properties is 200 feet long, 15 to 20 feet wide and 130 feet deep.

Geology: The calcite-mica-apatite leads are associated with dikes of pyroxenite cutting gneiss. The general strike is N20°E. The deposits are of the fissure and pocket class.

Reference: de Schmid (1912, p. 173).

Lots 18 and 19, Concession VI

Location: Lots 18 and 19, concession VI, North Burgess township, Lanark county.

Minerals Present: Phlogopite.

Development: A few surface pits have been opened on mica-bearing outcrops. The lots were owned in 1912 by M. Killeen of Stanleyville and A.J. Mathieson of Toronto.

Reference: de Schmid (1912, p. 174).

Star Hill Mine

Location: Lots 20 and 21, concession VI, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite.

Development: The mine was owned by Wilson and Greene and worked by P.C. McParland of Westport, Clemow and Powell of Ottawa and the owners. In May 1910 Thompson, Donnelly and Gemmell commenced operations under lease. The older workings reached 50 feet in depth. The main mica opening was an open cut 22 feet deep driven into the side of a small ridge.

Geology: Mica and apatite occur in calcite veins cutting dark pyroxenite. The veins strike east-west and average 2½ feet wide at the surface. The new pits on lot 20 are on NE-trending leads which dip NW.

Reference: de Schmid (1912, p. 174).

Lot 9, Concession VII

Location: Lot 9, concession VII, North Burgess township, Lanark county.

Minerals Present: Apatite, phlogopite, calcite.

Development: This old phosphate property was first worked

for mica from 1904 to 1906 by Edward Smith. The main pit is 90 feet deep, 65 feet long, and 5 feet wide. Several other openings have been carried to depths of 40 and 50 feet.

Geology: Mica occurs with apatite and calcite in fissures in pyroxenite dikes which strike NW and cut granite gneiss at intervals of 15 to 30 feet. The mica is light silver amber to brownish amber and is of fair quality, some being crushed and impaired by calcite inclusions.

Reference: de Schmid (1912, p. 175).

Otter Mine

Location: Lot 11, concession VII, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite.

Development: The mine was owned in 1912 by Mr. McLaurin of Perth. In 1937, 1950 and 1952, 255 tons of mica valued at $4,389 was produced by H.V. Bennett and F. Powers of Stanleyville. In 1912 the main pit was 45 feet long, 4 to 12 feet wide, and about 35 feet deep.

Geology: The mica-apatite-calcite leads strike N20°E and dip 80°SE. The leads are on the contact of pyroxenite to the NW and gneiss to the SE.

Reference: de Schmid (1912, p. 175).

Byrnes Mine

Location: Lot 12, concession VII, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, sparse calcite.

Development: Originally a phosphate mine, it was worked about 1900 by P. Byrne of Micaville for mica. In 1901 the General Electric Company bought the property and did some prospecting in 1904. A number of old phosphate pits exist, none of which is deeper than 60 feet.

Geology: Narrow leads carrying dark crushed mica, red apatite and little calcite, strike NW and dip NE. The leads occur in pyroxenite and along its contact with gneiss. The veins seldom exceed 10 feet in width.

Reference: de Schmid (1912, p. 176).

Lot 20, Concession VII

Location: Lot 20, concession VII, North Burgess township, Lanark county.

Minerals Present: Phlogopite.

Development: In 1947 J.G. Donnelly of Stanleyville produced 49 tons of phlogopite valued at $686.

Reference: Statistics Office, Ontario Department of Mines.

Lot 1, Concession VIII

Location: Lot 1, concession VIII, North Burgess township, Lanark county.

Minerals Present: Apatite, phlogopite, pink calcite, scapolite, pyrite, marcasite.

Development: The mine was worked for phosphate many years ago by the Anglo-Canadian Phosphate Company. In 1908 R. McConnelly of Ottawa acquired the mine and worked it in 1909 and 1910. The workings consisted of three main pits, the largest being

100 feet long, 15 feet wide and 40 feet deep.

Geology: The mica-apatite-calcite bodies occur at the contact of pyroxenite and gneiss.

Reference: de Schmid (1912, p. 176).

Otty Lake Mine

Location: Lot 2, concession VIII, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, calcite, scapolite, wilsonite.

Development: An old Anglo-Canadian phosphate mine, the property was acquired in 1907 by Kent Brothers and operated until 1910. In 1902, 1908, 1909 and 1910, a total of 35 tons of mica was produced, valued at $4,725. The largest opening is 60 feet long, 25 feet deep and 25 feet wide.

Geology: The mica occurs in pockety leads in pyroxenite, with calcite and apatite. The vein averages three feet in width, and strikes northwest.

Reference: de Schmid (1912, p. 177).

Cordick Mine

Location: Lot 3, concession VIII, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite.

Development: An old Anglo-Canadian phosphate mine, this property was worked in 1908 for mica by Kent Brothers of Kingston. The mine was worked by Rinaldo McConnell in 1917 with a production of 4 tons of mica valued at $906. The workings consist of shallow pits and trenches.

Geology: The mica-apatite veins strike northwest and average about 2 feet in width. The veins are bordered by pyroxenite which cuts quartz syenite.

Reference: de Schmid (1912, p. 178).

McLaren Mine

Location: Lots 4, 5 and 6, concession VIII, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, scarce calcite.

Development: Lots 5 and 6 were originally worked for phosphate in the 1880's. Mica was produced in 1906-1909, 1911-1914 and 1916-1917. A total of 151 tons of mica valued at $22,188 was produced. The deepest pits exceed 100 feet.

Geology: There are a series of long, narrow fissure veins striking NW and dipping SW. The principal vein matter is phosphate in which the mica crystals are imbedded. The mica is of good quality and occurs in crystals over 2 feet in diameter.

Reference: de Schmid (1912, p. 178).

Lot 7, Concession VIII

Location: Lot 7, concession VIII, North Burgess township, Lanark county.

Minerals Present: Phlogopite, little calcite and phosphate.

Development: The property belonged to W.H. Adams of Micaville and was operated under lease by Webster and Company in 1892. Work has been done intermittently since. Numerous pits up to 60 feet deep have been put down.

Geology: Mica with a little calcite and apatite occurs in fissures and pockets in pyroxenite dikes trending

east-west on the northwest part of the property and trending northwest near the lake. The mica is crushed in some places.

Reference: de Schmid (1912, p. 179).

Lot 25, Concession VIII

Lot 26, Concession IX

Location: Lot 25, concession VIII and lot 26, concession IX, North Burgess township, Lanark county.

Minerals Present: Phlogopite.

Development: The mine was worked by P. McParland of Westport from 1907 to 1912. The workings are surface pits not exceeding 25 feet in depth.

Reference: de Schmid (1912, p. 179).

Atchison Mine

Location: Lot 4, concession IX, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite, pink calcite.

Development: The mine belonged to Allan Atchison of Perth and was worked by Watts, Adams and Noble in 1912. One pit 15 feet long, 6 feet wide and 30 feet deep is on a lead of mica, green apatite and pink calcite between walls of pyroxenite. The vein has a northwest strike.

Reference: de Schmid (1912, p. 179).

East Half Lot 6, Concession IX

Location: East half of lot 6, concession IX, North Burgess township, Lanark county.

Minerals Present: Phlogopite, apatite.

Development: This was an old phosphate property worked for mica in 1906 by Adams and Noble of Perth and in 1910 by J.H. Mendels of Perth. Numerous pits exist on the property.

Geology: Leads of phosphate and mica strike N85°W.

Reference: de Schmid (1912, p. 180).

East Half Lot 7, Concession IX

Location: East half of lot 7, concession IX, North Burgess township, Lanark county.

Minerals Present: Phlogopite, pink calcite.

Development: The mine was worked in 1905 by W.H. Adams of Micaville who produced mica valued at $12,000. One pit 20 feet deep was put down.

Geology: A small pocket and fissure lead of mica with minor pink calcite occurred in a black pyroxene-hornblende dike.

Reference: de Schmid (1912, p. 180).

Lot 14, Concession IX

Location: Lot 14, concession IX, North Burgess township, Lanark county.

Minerals Present: Phlogopite, calcite.

Development: The mine was owned by J. Russell of Micaville and worked by P. Murphy about 1907. A number of small pits were opened on northwest leads

having an average width of 2½ feet. None of the pits exceed 15 feet in depth.

Geology: The mica occurs principally on the contacts of narrow pyroxenite spurs with a red, fine-grained, feldspathic rock.

Reference: de Schmid (1912, p. 180).

Pike Lake Mine

Location: Lots 16 and 17, concession IX, North Burgess township, Lanark county.

Minerals Present: Phlogopite, pyrite, tourmaline.

Development: This was one of the first mica mines having been opened in 1860. The mine was worked by the Lake Girard Mica System in 1892; Watts and Noble of Perth; Farry and McParland; The Mica Manufacturing Co. Ltd. of Ottawa, and W.A. Allan. Numerous pits were sunk, some to depths of over 100 feet.

Geology: The mica leads strike NW and dip SW. They occur in a soft, grey, friable rock.

Reference: de Schmid (1912, p. 181).

NORTH ELMSLEY TOWNSHIP

Wildman or Gibson Mine

Location: Lot 25, concession IX, North Elmsley township, Lanark county.

Minerals Present: Phlogopite, apatite.

Development: Early work was carried out by Gibson and Hayes in 1901 and by L. Gemmell of Perth. In 1920 the mine produced 17 tons of mica valued at $764. The mica was said to be dark in colour and crushed.

Reference: de Schmid (1912, p. 186).

Gibbs Creek Mine

Location: 2½ miles from Perth.

Minerals Present: Phlogopite.

Development: L.J. Gemmell of Perth produced 2 tons of mica valued at $1,150 in 1902.

Reference: Statistics Office, Ontario Department of Mines.

SOUTH SHERBROOKE TOWNSHIP

Lot 7, Concession II

Location: Lot 7, concession II, South Sherbrooke township, Lanark county.

Minerals Present: Phlogopite, calcite, pyrite.

Development: The mine was owned in 1909 by W. Fowler of Bolingbroke and operated by Mr. Austin of Toronto. The main pit is 20 feet deep, 15 feet wide and 30 feet long.

Geology: The mica lead strikes N65°W in dark pyroxenite cutting dark gneiss. The mica is a very dark variety and much crushed. It is associated with much pyrite and minor calcite.

Reference: de Schmid (1912, p. 181).

Cook Mine

Location: Lot 9, concession II, South Sherbrooke township, Lanark county.

Minerals Present: Phlogopite, calcite, pyrite.

Development: The property was first mined by T. Cook in 1900. In 1904 considerable work was done by Mills and Cunningham. The main pit is an inclined stope 40 feet long, 80 feet deep and 8 feet wide, sunk on a contact deposit of mica between a hangingwall of pyroxenite and a footwall of dark gneiss.

Geology: The mica lead strikes N78°E and dips 52°N and has an average width of 2½ feet. The mica is somewhat twisted and crushed.

Reference: de Schmid (1912, p. 182).

North Half, Lot 4, Concession III

Location: North half of lot 4, concession III, South Sherbrooke township, Lanark county.

Minerals Present: Phlogopite, pink calcite, sparse apatite.

Development: The property was owned in 1912 by Miller and Innes of Battersea. It was first worked by Mr. McNally of Westport about 1902 and subsequently by Cunningham and Mills of Kingston. The owners worked the property in 1909. Surface pits up to 30 feet deep have been put down.

Geology: The average width of mica leads is 2 feet. The mica is light amber.

Reference: de Schmid (1912, p. 183).

Lot 7, Concession III

Location: Lot 7, concession III, South Sherbrooke township, Lanark county.

Minerals Present: Phlogopite, pyrite, tourmaline.

Development: The property was owned by John Ritchie of Bolingbroke, and worked in 1909 by a Battersea syndicate. A pit was opened to a depth of 12 feet.

Geology: The mica appeared to occur in a pocket in a pyroxene-feldspar rock impregnated with pyrite and carrying considerable tourmaline.

Reference: de Schmid (1912, p. 184).

East Half, Lot 2, Concession IV

Location: East half of lot 2, concession IV, South Sherbrooke township, Lanark county.

Minerals Present: Phlogopite.

Development: The property was owned by J. McEwen of Bolingbroke and was worked by several parties on a small scale from 1909 to 1912. The mica was an excellent light amber.

Reference: de Schmid (1912, p. 184).

West Half, Lot 2, Concession IV

Location: West half of lot 2, concession IV, South Sherbrooke township, Lanark county.

Minerals Present: Phlogopite, pink calcite.

Development: The property was owned by S. Dowell of Bolingbroke and worked first in 1907 by D. Anderson of Perth. The largest pit was 20 feet deep.

Geology: A lead 3 feet wide carries phlogopite and pink calcite. It occurs on the contact of pyroxenite and marble. The contacts trend N75°E.

Reference: de Schmid (1912, p. 184).

Lot 8, Concession IV

Location: Lot 8, concession IV, South Sherbrooke township, Lanark county.

Minerals Present: Phlogopite, pink calcite.

Development: The mine was opened by the General Electric Company in 1905. There are several openings; the main one is 56 feet deep.

Geology: A fissure lead of mica with pink calcite cuts green pyroxenite. The lead at the bottom of the main pit is 3½ feet wide. The lead strikes N20°W and dips 80°E.

Reference: de Schmid (1912, p. 185).

LEEDS COUNTY

BASTARD TOWNSHIP

Rodgers Mine

Location: Lot 14, concession III, Bastard township, Leeds county.

Minerals Present: Phlogopite.

Development: Wm. A. Rodgers and J.E. Sullivan in 1924 produced 481 pounds of mica valued at $87.

Reference: Spence (1929, p. 74).

NORTH CROSBY TOWNSHIP

Lot 16, Concession II

Location: Lot 16, concession II, North Crosby township, Leeds county.

Minerals Present: Phlogopite, calcite.

Development: J. Egan of Westport commenced work in 1904; in 1908 H. Adams of Westport worked the property. Two small pits were opened to a depth of 15 feet.

Geology: A small fissure vein of phlogopite in somewhat crushed crystals cuts dark pyroxenite. Little calcite occurs in the lead. The pyroxenite dike cuts marble.

Reference: de Schmid (1912, p. 186).

Lot 18, Concession II

Location: Lot 18, concession II, North Crosby township, Leeds county.

Minerals Present: Phlogopite.

Development: Mica mined on this lot in 1906.

Reference: de Schmid (1912, p. 186).

Lot 21, Concession II

Location: Lot 21, concession II, North Crosby township, Leeds county.

Minerals Present: Phlogopite.

Development: The property belonged to J. Smith of Cedar Bridge and was worked in 1900. The deepest opening was down 25 feet.

Geology: It is a contact deposit having a mica lead between a pyroxenite dike and dark gneiss.

Reference: de Schmid (1912, p. 186).

Lot 8, Concessions III and IV

Location: Lot 8, concessions III and IV, North Crosby township, Leeds county.

Minerals Present: Phlogopite.

Development: The property was owned by C. Drysdale of Westport. Work was done in 1907 on concession IV.

Reference: de Schmid (1912, p. 186).

Lot 9, Concession V

Location: Lot 9, concession V, North Crosby township, Leeds county.

Minerals Present: Phlogopite, apatite.

Development: The property was owned by J. Foley of Westport and was opened in 1905 by McBelton and Taggart. The pit was opened to a depth of 18 feet.

Geology: The mica-apatite lead is in pyroxenite and strikes NW. The mica is somewhat crushed.

Reference: de Schmid (1912, p. 186).

Lot 22, Concession IX

Location: Lot 22, concession IX, North Crosby township, Leeds county.

Development: The property belonged to W.J. Webster of Edmonton; the mine was opened by Taggart and Arnold in 1900. A few surface pits were put down, one being 15 feet deep.

Geology: The mica lead strikes NE.

Reference: de Schmid (1912, p. 187).

SOUTH BURGESS TOWNSHIP

Heffron Mine

Location: Lot 5, concession I, South Burgess township, Leeds county.

Minerals Present: Phlogopite, apatite, pink calcite, pyrite.

Development: The property was first worked in the 1880's by W. Plummer of Boston. Later it was worked by Webster and Company, and G.W. McNaughton, the latter in 1905 and 1906. A number of long, narrow pits were opened on parallel mica leads. The largest opening was 60 feet deep, 50 feet long and 6 feet wide.

Geology: The veins are composed of pink calcite, phlogopite, apatite and some pyrite. Some excellent mica was produced. The leads cut pyroxenite.

Reference: de Schmid (1912, p. 188).

Lot 7, Concession I

Location: Lot 7, concession I, South Burgess township, Leeds county.

Minerals Present: Phlogopite, some pyrite, little apatite or calcite.

Development: The property was owned by Webster and Company and last worked by Gemmell and McLaren. An open cut in the hillside is 60 feet long, 35 feet deep and 30 feet wide.

Geology: The mica fissure vein in pyroxenite strikes N70°W.

Reference: de Schmid (1912, p. 189).

Lot 4, Concession II

Location: Lot 4, concession II, South Burgess township, Leeds county.

Minerals Present: Phlogopite.

Development: The mine was operated in 1928 by Damon Smith, producing 47 tons of mica valued at $4,082.

Reference: Statistics Office, Ontario Department of Mines.

Lot 3, Concession III

Location: Lot 3, concession III, South Burgess township, Leeds county.

Minerals Present: Phlogopite.

Development: The property belonged to Webster and Company and some surface work was carried out about 1902. It was re-opened by A.G. Martin in 1924 and in 1926 produced 563,062 pounds of mica valued at $31,785.

Reference: de Schmid (1912, p. 190).

Cantin Mine

Location: Lot 1, concession IV, South Burgess township, Leeds county.

Minerals Present: Phlogopite, apatite, calcite, pyrite.

Development: This was an old phosphate producer first worked for mica in 1893 by Webster and Company. It was later owned by the General Electric Company. The main pit is 85 feet long, 110 feet deep and 12 to 25 feet wide.

Geology: The mica lead strikes N80°E and is on the contact of pyroxenite and granite gneiss.

Reference: de Schmid (1912, p. 190).

Lot 4, Concession IV

Location: Lot 4, concession IV, South Burgess township, Leeds county.

Minerals Present: Phlogopite.

Development: Worked in 1900 by Noble and Watts of Perth, producing 10 tons of mica valued at $3,300.

Reference: Statistics Office, Ontario Department of Mines.

SOUTH CROSBY TOWNSHIP

Sand Lake Mine

Location: Lot 14, concession VII, South Crosby township, Leeds county.

Minerals Present: Phlogopite, pyrite, apatite, calcite.

Development: The mine was originally a phosphate producer. It was acquired in 1900 by Brockville Mining Company who worked in 1900 and 1905 to 1907. The mine was subsequently worked in 1912 producing 12 tons of mica valued at $20,570. The main pit is circular and 25 feet across and 75 feet deep.

Geology: A chimney deposit of mica in fissures in pyroxenite and biotite gneiss.

Reference: de Schmid (1912, p. 187).

SOUTH ELMSLEY TOWNSHIP

H. J. Bennett

Location: Lot 30, concession III, South Elmsley township, Leeds county.

Minerals Present: Phlogopite.

Development: The mine was operated by Herbert J. Bennett in

1925 with a production of 270 tons of mica valued at $2,970.

Reference: Statistics Office, Ontario Department of Mines.

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